Exemption No. 5649

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

Boeing Commercial Airplane Group **Regulatory Docket No. 26922**

for an exemption from § 25.855
of the Federal Aviation Regulations

PARTIAL GRANT OF EXEMPTION

By letters B-TO2T-92-1236 dated June 9, 1992, and B-T02T-92-1412 dated June 30, 1992, Mr. K. B. Buchanan, Manager, Airworthiness, Orgn. B-TO2T, Mail Stop 05-02, Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207, petitioned for an exemption from the cargo compartment liner requirements of § 25.855(c) of the Federal Aviation Regulations (FAR). This exemption effects the latches used in the decompression vent doors, the joints between the decompression vent doors and the partition structure, and the close-out structure located beneath the partition and decompression vent doors on the Boeing Model 747-400F airplanes.

Section of the FAR affected:

Section 25.855(c), Amendment 25-60, which prescribes requirements for cargo and baggage compartments.

Related sections of the FAR:

Section 25.857 which prescribe requirements for cargo and baggage compartments, and Part 25, Appendix F, Part III which prescribes flammability requirements of liner material.

The petitioner's supportive information is as follows:

> "The 747-400F, design has a "C" Lower Lobe Cargo Compartment and must comply with the subject Fireworthiness Regulation for Cargo Liners. The forward partition (just aft of the main Electrical/Electronic (E/E) equipment bay) has a small area which does not comply with the burn- through test of FAR 25.855 (c), Amendment 25-60. This non-compliant area is comprised of the following three parts:

(1) The latches used on the decompression vent doors.

(2) The joints between the decompression doors and partition structure.

(3) The close-out structure located beneath the partition panels and decompression doors.

"The item (1) and (2) designs were developed and certified for decompression venting between the cargo bay and the E/E bay forward of the partition. Any changes to the configuration of these designs could affect certification of the decompression vent system. The item (3) design involves detail parts which are located close to the floor area, where heat from a cargo bay fire is expected to be less intense than in areas closer to the ceiling. The forward cargo partition is located directly behind the main E/E wiring integration rack which contains critical aircraft systems.

"The venting design and detailed parts mentioned above are the same as found on the 747-400 Passenger/Combi airplane which is operating with these same features by an exemption to FAR Amendment 121-202.

"The percentage area not in compliance is 5.5% of the total forward partition area which is 12,797 square inches."

"The FAA is requested to approve this petition for exemption to FAR 25.855(c), Amendment 25-60 for the non-compliance areas of the forward partition, Lower Lobe, "C" Cargo Compartment. We believe that design changes to comply with 25.855(c), Amendment 25-60 will not provide commensurate safety enhancement compared to the cost for modification. Further, the 747-400F is a non-passenger airplane to be certified for a maximum of eight occupants (two crew and six persons)."

Granting the petition would be in the public interest because it would:

(1) Save the operator the expense of redesign and recertification which would not result in any commensurate increase in safety.

(2) Improve the potential for sale to foreign operators, thereby improving the U. S. balance of payments.

A summary of the petition was published in the Federal Register (57 FR 36118) on August 12, 1992. No comments were received.

The FAA's analysis/summary is as follows:

The FAA has carefully considered the information provided by the petitioner, as well as other relevant information, and has determined that there is sufficient merit to warrant partially granting this petition. The following background information, not provided as part of this petition was considered:

The FAA has conducted testing of cargo compartment ceiling liners with small diameter holes in them to determine the largest diameter hole that could be in the ceiling liner and still meet the maximum temperature of 400°F; four inches above the upper surface of the horizontal surface requirement. (A copy of the test report, FAA Technical Note DOT/FAA/CT-TN89/17, has been placed in the Rules Docket). The testing demonstrated that a 0.375 inch diameter hole in the ceiling of the cargo compartment was the largest diameter hole that would still meet the 400°F requirement. Based on the testing conducted for the ceiling liner with small diameter holes, which is more critical than the sidewall liner with small holes, it is reasonable that the 0.375 inch diameter holes resulting from the burn through of the decompression vent door latch handles does not result in a high increase in the temperature in the E/E equipment bay. However, the testing did not investigate effect of the 0.375 inch diameter hole on flame penetration through the hole. If the latch handles burn through, the decompression vent door will remain latched in the closed position. The location of the resulting 0.375 inch diameter holes is in the passageway within the E/E equipment bay. Because of the location of the resulting holes there is no flammable equipment or surfaces in close proximity to the resulting holes that the flame could impinge on. Therefore, the resulting 0.375 inch diameter holes would not have an adverse effect on the fire properties of the cargo liner and would contain the fire in the cargo compartment.

With respect to the joint between the decompression vent doors and the partition structure, the seal material does not meet the burn through requirements § 25.855. Boeing has requested an exemption for this seal based on the high cost of recertification and retrofit for this small part. Also, Boeing does not consider the replacement of the seal would improve the safety of the airplane. The FAA does not agree with the Boeing position concerning the seal. The retention of the Halon is very critical when it is discharged into the cargo compartment as the result of indication of smoke/fire in the cargo compartment. Also, Boeing has not attempted to find a replacement material for the seal.

The Model 747-400 and 747-400D airplanes were granted a temporary exemption (Exemption No. 5619) until March 20, 1994, for the joints between the decompression doors and partition structure from § 121.314 Amendment 121-202 requirements. The design of the joints and the certification requirements for the 747-400/-400D and 747-400F are the same. The only difference between the applications is that the

747-400/-400D airplanes are in service whereas the 747-400F has not been certificated and therefore, no retrofit of in-service airplanes is required. The type certification date of the Model 747-400F is scheduled for September 13, 1993.

By letter B-T02T-93-0448 dated March 3, 1993, Boeing informed the FAA that item (3), the close-out structure located beneath the partition panels and decompression doors design, has been changed and now complies with the fireworthiness requirements of § 25.855(c), Amendment 25-60.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest, and will not adversely affect safety. Therefore, pursuant to the authority contained in §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, delegated to me by the Administrator (14 CFR 11.53), the petition of the Boeing Commercial Airplane Group for exemption from the requirements of § 25.855(c) of the FAR is granted for Models 747-400 and 747-400D airplanes equipped with Class "C" Lower Lobe Cargo Compartment as follows:

(1) a permanent grant of exemption for the latches used on the decompression vent doors.

(2) a denial of exemption, for the joints between the decompression vent doors and partition structures.

Issued in Renton, Washington, on April 27, 1993.

/s/ Darrell M. Pederson
Assistant Manager, Transport Airplane Directorate
Aircraft Certification Service, ANM-100

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